he soon thought fit to leave this profession, and being well equipped with the necessary private resources, he commenced in the year 1848 to erect an observatory in the city of New York at his own residence. On its completion, it was furnished with an 11¼-inch refractor, which he had made under his own personal direction by Fitz, and a transit instrument.

The first work he set himself to do related to the spectra of the stars. As soon as Kirchhoff's discovery was announced, Donati, at Florence, in 1860, made the first efforts in this direction; this was followed by other observers, among whom was Rutherfurd. In 1863 he published his first paper on the spectra of the celestial bodies, and indicated that the various stellar spectra which he had then observed were susceptible of being arranged in different groups. His paper, which was published in *Silliman's Journal*, vol. xxxv. p. 71, contained the following extract with reference to this classification:—"The star spectra present such varieties that it is difficult to point out any mode of classification. For the present, I divide them into three groups: First, those having many lines and bands, and mostly resembling the sun, viz. Capella, β Geminorum, α Orionis, &c. These are all reddish or golden stars. The second group, of which Sirius is the type, presents spectra wholly unlike that of the sun, and are white stars. The third group, comprising α Virginis, Rigel, &c., are also white stars, but show no lines; perhaps they contain no mineral substance, or are incandescent without flame."

Turning his attention to object-glasses for visual and photographic purposes, he described in 1865 a new form which he had specially designed for the latter. This, needless to say, brought about a great revolution in the processes employed. The history of his early attempts to produce photographically corrected object-glasses, and the wonderfully sharp and beautiful photographs of the moon which he finally obtained, will always be marked as an important era in the application of the camera to the equatorial telescope. The photographs taken at the present day, even although they are produced with larger lenses and with a more perfect knowledge of photographic processes, and with the advantages afforded by dry plates, excel only in a trifling degree those taken with the small Rutherfurd equatorial.

Another important piece of work, which occupied him some considerable time, was the mapping, by means of the photographic process, of star clusters and star groups. His ingenuity in devising and constructing accurate micrometers for measuring the impressions of the star clusters opened out a new method by which the proper motion of the stars could be photographically determined, and even their parallaxes, eliminating entirely the errors of observers.

It was absolutely essential, as he knew, in order to obtain a perfect method of measurement of the photographs, to attain the utmost perfection in the cutting of the threads of the micrometer screw, and some idea of the care which he bestowed on them may be gathered from the fact that he took three years to make a single screw. In order to test its quality, it struck him that it would be a happy thought to see if it would enable him to rule a grating. He accordingly set the apparatus up in his bedroom, and by means of an automatic arrangement kept it going all night, as at that time the local vibrations were fewest. The result was that he was able to make the most perfect gratings known, which are only now surpassed by those of Rowland, who followed in his wake.

The photographic corrector, which consisted of an additional lens to be applied to visual object-glasses, to render them fit for photographic use, was also due to his exceptional mechanical ability, and was brought out in the year 1868.

Owing to failing health he was at last obliged to give up all idea of making observations, so he resigned himself to a thorough supervision of the great number of measurements of the photographs of the star clusters that by this time had very considerably accumulated.

In the year 1884, Columbia College, New York, was the recipient of all his astronomical instruments, apparatus, and completed measures. It is only a fortnight ago when a notice of the measures of the Pleiades, which were prosecuted by Mr. Jacoby, under the direction of Prof. Rees, was made in these columns, and it will not be long before several other clusters will be published.

In this brief notice we have only referred to some of the more salient points with which he enriched the domain of astronomical science; and his was no mean spirit striving to confine to his own use the various methods of work and improvements he introduced: he scattered his gratings with a lavish hand among all who were likely to make any use of them, and his greatest delight was to help others occupied in researches kindred to his own.

NOTES.

SIR ARCHIBALD GEIKIE has been appointed by the Council of the Royal Society to be one of the Governors of Harrow School.

IT was with deep regret that we saw the announcement in Monday's *Times* of the death of Admiral Mouchez, the Director of the Paris Observatory. In him France has lost one of her most active men of science, whose place it will be no easy task to fill.

AT St. John's College, Cambridge, on July 9, at 2.30 p.m., there will be held a meeting of the General Committee that was formed for placing a suitable memorial of the late Prof. Adams in Westminster Abbey. This meeting is specially called to consider a modification in the form of the memorial. The resolution, as passed in February, was to the effect that the memorial should "consist of a bust with tablet and inscription," but as the Dean has been unable to sanction any site in that part of the Abbey in which it was first proposed to be placed, but has offered an excellent position for a medallion, near the monument of Newton and the grave of Sir John Herschel, and close to the memorials of Darwin and Joule, the Executive Committee recommend that this offer be accepted, and that the terms of the former resolution be altered to "That the memorial consist of a medallion and inscription."

THE *Botanische Zeitung* publishes a programme of the International Botanical Congress to be held in Genoa. On Sunday evening, September 4, there will be a reception of the foreign botanists present. On Tuesday the Botanical Institute and Garden, presented to the Municipality of Genoa by Mr. Thos. Hanbury, will be formally opened. On Saturday, September 10, the Acclimatisation Garden of Mr. Hanbury at Mortola will be visited. The rest of the week will be occupied by scientific sittings, receptions, and excursions.

DR. BENECKE, the Director of the Experimental Station at Klaten, Java, has offered a prize of 1000 marks for the best essay, founded on original observations and experiments in cultivation, on the causes of the red colour in the fibrovascular bundles of *Sorghum*, which accompanies the disease known as "sereh." A very similar disease has recently become very destructive to the sugar-cane crop in Java.

IN our account last week of the Ladies' *Conversazione* of the Royal Society we stated that the Telephone Company's installation was the means by which the music from the Paris opera was rendered audible. This, as we have reason now to know, was incorrect. The Post Office undertook the whole affair, no company having anything at all to do with it.

PROF. BURT G. WILDER, M.D., of Cornell University, sends us the following correction:—In a circular, "American Reports upon Anatomical Nomenclature," issued last winter by Prof. Wilder, as Secretary of the Committee of the Association of American Anatomists, in the third paragraph of the third page, the Chairman of the Committee of the Anatomische Gesellschaft should be Prof. A. von Kölliker, and the Chairman of the American division (appointed in 1891 by the American Association for the Advancement of Science) of the International Committee on Biological Nomenclature should be Prof. G. L. Goodale. Prof. Wilder desires to express his regret for the errors, due in the one case to his own misapprehension, and in the other to a clerical mistake.

UNDER the title of "The Cambridge Natural History," Messrs. Macmillan and Co. have in active preparation an important series of volumes on the Natural History of Vertebrate and Invertebrate Animals, edited, and for the most part written, by Cambridge men. While intended in the first instance for those who have not had any special scientific training, the volumes will, as far as possible, present the most modern results of scientific research. Thus the anatomical structure of each group, its development, palæontology, and geographical distribution, will be considered in conjunction with its external character. Care will, however, be taken to avoid technical language as far as possible, and to exclude abstruse details which would lead to confusion rather than to instruction. The series will be under the general editorship of Mr. J. W. Clark, the University Registrar, and Mr. S. F. Harmer, Superintendent of the Museum of Zoology. The following writers are engaged upon the groups which precede their names:—*Mammals*, Mr. J. J. Lister; *Birds*, Mr. A. H. Evans; *Reptiles* and *Amphibia*, Dr. Gadow, F.R.S.; *Fish*, Mr. W. Bateson; *Mollusca*, Mr. A. H. Cooke; *Polyzoa*, Mr. S. F. Harmer; *Brachiopoda*, Mr. A. E. Shipley; *Insects*, Mr. David Sharp, F.R.S.; *Myriapoda*, Mr. F. G. Sinclair; *Arachnoida*, Mr. C. Warburton; *Crustacea*, Prof. W. F. R. Weldon; *Cœlenterata*, Mr. S. J. Hickson; and *Sponges*, Dr. W. J. Sollas. It is hoped that some of the volumes which are already far advanced may appear in the course of next year. The series will be fully illustrated.

THE weather during the past week has been unsettled, but considerably warmer generally. Towards the close of last week solar halos were visible in the south, and a depression moved along our west coasts in a north-north-easterly direction, accompanied by showers, while the daily temperatures reached upwards of 70° in the inland parts of England. At the beginning of the present week, a still further increase of temperature occurred, the maxima exceeding 80° in the midland and eastern parts of England, and fog became prevalent over the Channel and the southern parts of England. The atmospheric conditions, which during the greater part of the period were cyclonic, with moderate or strong south-westerly winds, amounting to a strong gale from the westward in Caithness on Monday, subsequently became anticyclonic with light north-easterly and easterly winds over England; but on Tuesday evening a depression lay over the mouth of the Channel, the conditions rapidly became more unsettled, and a very severe thunderstorm occurred on that night in London and the greater part of England, accompanied by heavy rain. The *Weekly Weather Report* for the period ending the 25th instant shows that the rainfall exceeded the mean in nearly all districts; in the eastern and southern parts of England the excess was rather large. But reckoning from the beginning of the year there was still a deficit in all districts, although the amount was trifling in the north-east and north-west of England.

A NEW meteorological journal, entitled *L'Atmosphère*, has recently appeared in Paris. It contains several short original articles and miscellaneous notes collected by the director of a private observatory, named Tour Saint-Jacques. At present there is no such journal published in France, excepting the *Annuaire* of the Meteorological Society, containing the papers read by its members. The current number (No. 5) contains an article on the optical phenomena of the atmosphere, by A. Cornu, member of the Institute, and one on solar phenomena and terrestrial magnetism, by E. Marchand, of the Lyons Observatory. It also gives a list of the principal meteorological papers published in recent serials.

A SERIES of severe earthquake shocks is reported from Guodolajara, Mexico. The first shock was felt last Friday night, and lasted eighteen seconds. Windows were broken and plastering cracked in numerous houses, and hundreds of panic-stricken people took refuge in the streets until daylight. On Saturday a second shock occurred, wrecking a number of buildings. Several persons were seriously hurt, but in no case are their injuries expected to prove fatal. Several other shocks have been felt since. The volcano Colima is said to be in a state of much activity. Great volumes of sulphur, smoke, and lava are issuing from the crater.

A PAPER setting forth a proposal for a national photographic record and survey, by Mr. W. J. Harrison, was lately read before the Photographic Society of Great Britain, and has now been issued separately. Mr. Harrison's idea is that a pictorial record of the present condition of the country should be secured by photography, the work being accomplished by professionals, individuals (amateurs), photographic societies, and agencies under the control of the Government. In the course of the paper he gives an interesting account of the way in which the local photo-survey of Warwickshire is being carried out.

ANTHROPOLOGISTS will read with interest some folk-songs and myths from Samoa, printed in the new number of the Journal and Proceedings of the Royal Society of New South Wales (vol. xxv.). They are translated by the Rev. G. Pratt, and introductions and notes are provided by Dr. John Fraser.

PROF. F. STARR will contribute to the July number of the *Popular Science Monthly* an article on "Anthropological Work in America." It will be accompanied by portraits of seventeen American anthropologists. According to *Science*, the article shows that "both in quality and amount, the work of Americans in this field compares favourably with that of Europeans."

A SOCIETY which may have opportunities of doing much valuable work has been formed in Wellington, New Zealand. It is called the Polynesian Society, "Polynesia" being intended to include Australia, New Zealand, Melanesia, Micronesia, and Malaysia, as well as Polynesia proper. The President is Mr. H. G. Seth-Smith, chief judge of the native land court, while the Queen of Hawaii is patron. We have just received the first number of the Society's Journal, in which there are papers on the races of the Philippines, by Elsdon Best; Maori deities, by W. L. Gudgeon; the Tahitian "Hymn of Creation," by S. P. Smith; Futuna, or Horne Island, and its people, by S. P. Smith; Polynesian causatives, by E. T.; and the Polynesian bow, by E. Tregear. There is also a paper giving the genealogy of one of the chieftainesses of Rarotonga, by a native of Rarotonga. The original was written in 1857, and is printed in the Journal, with a translation by Mr. Henry Nicholas, and notes by the editors. The editors are of opinion that the paper "apparently supports by direct traditional testimony the theory propounded by Hale, and subsequently advocated by Fornander, of the occupation of the Fiji Group by the Polynesian race, and of their later migration eastward to Samoa and the Society Group."

THE facility with which enlargements can now be produced, and the introduction of good commercial bromide paper, to say nothing of the artistic effects of the results, have all tended to increase the popularity of the practice of enlarging. When an amateur was formerly in need of moderate-sized pictures, he was compelled more or less to use a large camera, but now the inclination is to employ small cameras and therefore small plates, and to subsequently adopt the enlarging process to give him the required size picture. A very useful and handy little book treating of this process, written by Mr. John A. Hodges, has lately been issued by Messrs. Iliffe and Son, and contains much practical information for working either by artificial light or daylight. Methods of constructing cameras suitable for this work, lanterns, and various accessories, are all very well described and illustrated, and if carefully followed out will render many an amateur independent of the instrument-maker. In the section relating to the chemical manipulations there are also some useful hints which will save a beginner much annoyance and help him to produce satisfactory results.

OBERLIN COLLEGE, Ohio, is issuing a series of Bulletins giving the results of special work done in its museum and laboratories. Two have now been published, the first being a preliminary list of the flowering and fern plants of Lorain County. The second, which we have just received, contains a descriptive list of the fishes of Lorain County, and has been prepared by Mr. L. M. McCormick.

ACCORDING to the *Pioneer Mail* of June 8, the residents of Howrah have been finding lately that jackals are animals of anything but an attractive temper. In some cases they have come right up to the bungalows in search of prey. A little girl, aged about five years, was playing in a verandah, when a jackal suddenly rushed on her, and was dragging her away, when she was rescued. She was severely bitten. Three natives, while walking along Kooroot Road, were attacked by a jackal, which was only driven off after a stubborn fight; and a tale is told of two women, while standing near a tank, being attacked and bitten. So serious has the state of matters become, that the public propose to submit a memorial to the district magistrate praying for the adoption of measures for the destruction of these pests.

REFERRING to Malta's spring visitors, the *Mediterranean Naturalist* for June says that during the preceding month the valleys and gorges were alive with orioles, warblers, rollers, and bee-eaters. In the rich crimson clover enormous numbers of quails found shelter during their sojourn *en route* for the Continent, while the branches and foliage of the carob, the prickly pear, and the orange trees were thronged with harriers and larks.

MR. F. TURNER contributes to the April number of the *Agricultural Gazette of New South Wales* a paper on the carob bean tree as one of the commercial plants suitable for cultivation in New South Wales. The Agricultural Department distributed a quantity of seed last year, and some healthy young plants raised from this seed are now growing in several parts of the colony. Mr. Turner expects that when the tree becomes better known to cultivators it will be extensively grown to provide food for stock, more especially during adverse seasons. The carob can not only be trained into a very ornamental shade tree, but may be planted as a wind-break to more tender vegetation. He advises all who cultivate it to keep bees, if only a single hive. It is astonishing, he says, how many flowers these industrious insects will visit in the course of a day, and be the agency whereby they are fertilized.

SOME time ago a sugar school was established in connection with the State University, Lincoln, Nebraska, and if we may judge from the first formal report, lately submitted by Prof. Lloyd, it is likely to do much excellent work. The school opened on January 5 with twenty-five students. These students were mostly members of other classes in the chemical department of the University; the only preparation required for entrance being a clear conception of the principles of elementary chemistry, such as may be obtained in some of the high schools of Nebraska. The course consisted of two lectures a week, given by Mr. Lyon, with five hours of laboratory work. The lectures embraced the following subjects: (1) chemistry of the sugars; (2) technology of beet-sugar manufacture; (3) culture of the sugar beet. During the latter part of the winter term, Prof. DeWitt B. Brace gave the class four lectures on the theory of light, dealing with (1) the wave theory of light; (2) polarization of light; (3) rotation of the plane of polarization; (4) application of these principles to the polariscope and to the different forms of saccharimeters. It is hoped that in the coming year the work may be greatly extended.

A "Dictionnaire de Chimie industrielle" is being issued in parts, under the direction of A. M. Villon, by the "Librairie Tignol." It gives an account of the applications of chemistry to metallurgy, agriculture, pharmacy, pyrotechnics, and the various arts and handicrafts.

MESSRS. LONGMANS, GREEN, AND CO. have issued a third edition, revised and enlarged, of Prof. E. A. Schäfer's "Essentials of Histology." The intention of the author is to supply students with directions for the microscopical examination of the tissues.

A WORK on the "Migration of Birds," by Charles Dixon, will shortly be published by Messrs. Chapman and Hall.

A PAPER upon the oxidation of nitrogen by means of electric sparks is contributed, by Dr. V. Lepel, to the current number of the *Annalen der Physik und Chemie*. It is well known that small quantities of nitric and nitrous acids and their ammonium salts are produced during the passage of high tension electrical discharges through moist air. Dr. V. Lepel's experiments have been conducted with the view of obtaining more precise information concerning the nature of the chemical reactions which occur, and the experimental conditions most favourable for increasing the amount of combination. The first action of the spark discharge appears to be the production of nitric oxide, which is immediately converted by the oxygen present into nitrogen peroxide. The latter then reacts with the aqueous vapour present, forming nitric acid and liberating nitric oxide in accordance with the well-known equation $3NO_2 + H_2O = 2HNO_3 + NO$. It has been found, however, that the continued passage of sparks through the same quantity of moist air does not result, as might at first sight be expected, in the conversion of more and more of the atmospheric gases into oxidized products. For the passage of sparks through the gaseous oxides of nitrogen first formed results in their decomposition again into their elementary constituents. If, for instance, spark discharges are passing at the rate of one per second, the whole of the nitrogen peroxide molecules have not time to react with the water molecules to form nitric acid, before the passage of the next spark, and hence some of them suffer decomposition; indeed, it is probable that a number of the nitric oxide molecules first formed have not even time to combine with oxygen to form the peroxide before the passage of the next discharge, which brings about their dissociation. Hence it is that, in a closed space, a limit is soon reached beyond which there is no further increase in the amount of nitric acid. For this reason the yield of nitric acid has hitherto been very small. Dr. V. Lepel has made experiments, therefore, with a slowly moving atmosphere, and under different conditions of pressure, and with various types of spark discharge, with the result that he has already increased the amount of combination to 10 per cent. of the total amount of air employed. The air is exposed under increased pressure to a series of parallel spark discharges in the same tube. The change of atmosphere is not made continuously, but intermittently, and the gases are expelled from the discharge tube into a large absorption vessel in which the products are absorbed in a solution of water, or of a caustic alkali. Detailed accounts are given in the memoir of the efficacy of the various forms of high tension discharge, and Dr. V. Lepel is now experimenting with the discharge from a Töpler influence machine with sixty-six rotating plates. Of particular interest are his remarks concerning the probable effect of the high voltage discharges of which we have lately heard so much. He considers it not improbable that by their aid a new mode of producing nitric acid from the atmospheric gases on the large scale may be introduced, rendering us altogether independent of the natural nitrates as a source of nitric acid.

THE additions to the Zoological Society's Gardens during the past week include two Macaque Monkeys (*Macacus cynomolgus*) from North Borneo, presented by the Rev. Augustus D. Beaufort; two Small Hill Mynahs (*Gracula religiosa*) from India, presented by Lieut.-Col. W. S. Hore; a Chough (*Pyrrhocorax graculus*) from the Aran Islands, Galway, presented by Miss Balfour; four Sœmmerring's Pheasants (*Phasianus sœmmerringi* ♂ ♂ ♀ ♀) from Japan, presented by Mr. Frank Walkinshaw; an Æsculapian Snake (*Coluber æsculapii*), a Vivacious Snake (*Tachymenis vivax*) from Central Europe, presented by Mr. Alfred Scrivener; a Cayenne Lapwing (*Vanellus cayennensis*) from South America, two Axolotls (*Siredon mexicanus*) from Mexico, purchased; a Ruddy-headed Goose (*Bernicla rubidiceps* ♀) from the Falkland Islands, received in exchange; a Burchell's Zebra (*Equus burchellii* ♂); a Thar (*Capra jemlaica*), a Japanese Deer (*Cervus sika*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

VARIABLE NEBULÆ.—Mr. Barnard, in *Astronomische Nachrichten*, No. 3097, mentions the cases of two nebulæ which he supposes must be of a variable type. The first has a diameter of about 1′, and appears rather like a comet, the brightness gradually increasing towards the centre, there being no nucleus. Its position for 1889·0 was R.A. 3h. 56m. 17s., Declination + 69° 30′ 38″. The other nebula was discovered by him in 1888, and was estimated to lie between magnitudes 9 and 10, the stellar nucleus being of the thirteenth magnitude. Subsequent observations made in 1891 showed that this nebula had become considerably fainter (13½ mag.), there being still a faint nucleus visible; its diameter was estimated as ½′, while its position for 1888·0 was R.A. 0h. 37m. 55·7s., Decl. − 8° 48′ 6″·5.

VARIATION OF LATITUDE.—Mr. Chandler, toward the latter end of last year, contributed to the *Astronomical Journal* several articles on the variation of terrestrial latitudes, in which the following points were brought out:—(1) This variation is truly terrestrial. (2) The period of revolution, from 1863 to 1885, of the pole of the earth's figure round that of rotation amounted to 427 days in a west to east direction. (3) About the year 1730, the length of this period was a little over a year. (4) The velocity of rotation is slowly diminishing. In the present number (267) of the same journal he brings together evidence to establish some further conclusions at which he has arrived, basing them on a very considerable number of series of observations. The results may be briefly summarized as follows:—(*a*) About 1774 the rate of angular motion of the pole was a maximum with a daily rate of 1°·034, and since that period the decrease has taken place at an accelerating rate. (*b*) If θ be the daily angular motion and T the interval in days from September 18, 1875, the angular velocity of the polar motion may be put in the form

$$\theta = 0^\circ{\cdot}852 - 0^\circ{\cdot}000\,009\,8\,T - 0^\circ{\cdot}000\,000\,000\,132\,T^2,$$

(*c*) The law of the periodic variation may be expressed as follows:—

$$\phi = \phi_0 - 0''{\cdot}22 \cos[\lambda + (t - T)\theta],$$

where T is the time when the north pole of the earth's figure passes the Greenwich meridian,
E the number of completed revolutions between a given date, t, and the adopted epoch,
θ the daily angular motion,
ϕ the instantaneous value of the latitude of a place,
ϕ_0 the mean latitude,
and λ the longitude of the same place,

the values of T and θ being obtained from the equations—

$$T = 1875 \text{ Sept. } 18{\cdot}5 + 422^d{\cdot}56\,E + 1^d{\cdot}034\,E^2 + 0^d{\cdot}009\,E^3 + 0^d\,000067\,E^4,$$

$$\theta = \frac{360^\circ}{P},$$

when $P = 423^d{\cdot}62 + 2^d{\cdot}0953\,E + 0^d{\cdot}0274\,E^2 + 0^d{\cdot}000268\,E^3$.

(*d*) A sensibly constant angular distance between the poles of figure and rotation during the last fifty years has been maintained.

(*e*) By a comparison of absolute and differential determinations the variation is entirely due to zenithal alterations, and not to a simultaneous variation of the zenith and the astronomical pole.

COMPARATIVE SPECTRA OF HIGH AND LOW SUN.—Mr. Edward Stanford has just published five plates, 16¾ × 19⅝ inches, in portfolio form, of Mr. McClean's beautiful comparative photographic spectra of the high and low sun from H to A. The collotype prints have been reproduced from the mounted photographs by the Direct Photo-Engraving Company, and are enlarged about 8½ times from the original negatives. Published simultaneously also are his comparative spectral photographs of the sun and metals, extending from above H to near D. The two series include the platinum and iron-copper groups.

THE CORONOIDAL DISCHARGES.—The discovery of the presence and power of electricity is, comparatively speaking, very modern, and it is only now we are finding out the diversity of results it is capable of producing. The sun being our great source of heat and light, it is only natural that we should suspect him of having a greater quantity of this form of energy in some way or the other, on a scale, of course, very much greater than ours. In a paper read before the National Academy of Sciences, Washington, and published in the June number of the *American Journal of Science*, Mr. M. I. Pupin describes a series of experiments that he has been carrying out with regard to electrical discharges through poor media. The apparatus which he used is fully described, so we will only refer to the plates which illustrate the points he wished to emphasize. The illustrations are from photographs of discharges taken under conditions under which the solar corona is observed, and suggest in a very striking manner the phenomena that are usually observed at these times. In one case, when the vacuum was very poor, the discharge started in the form of four large streamers, together with large jets, their distribution over the whole surface of the sphere being more or less uniform. The appearance of the sphere "reminded me very much of the granular structure of the sun's disk, . . . and the very luminous points which appeared from time to time . . . reminded me . . . of the sun's faculæ." Further experiments regarding the rotational motion of the streamers lead him to conclude that two discharge streamers tended to blow each other out, "owing to the motion of the cooler gas between them, this motion being produced by the enormous heating effect of the discharge." The figures shown are very striking indeed, and represent the general appearances of the corona during eclipses with a remarkable degree of accuracy.

GEOGRAPHICAL NOTES.

M. JOSEPH MARTIN, well-known on account of his explorations in North-eastern Siberia, has died at Marghilan while on a journey in Central Asia.

THE Kalahari Desert has been crossed successfully by a "trek" of 150 waggons from the Rustenburg district of the Transvaal, bound for Mossamedes, where an active Boer colony has been established, a large party having embarked at Cape Town to join the overland division. Later reports affirm that